FURTHER NOTES ON THE ETHOLOGY OF ASTATA (HYMENOPTERA: SPHECIDAE)

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ABSTRACT

Notes are presented on the nesting behavior of *A. bicolor* Say and *A. leuthstromi* Ashmead. Two papers are added to the bibliography presented in review of the ethology of this genus published in the same Journal in 1957.

This paper is a supplement to observations on the nesting behavior of several species of the digger wasp genus *Astata* and a review of the ethology of the genus reported in the *Journal of the New York Entomological Society* (Evans, 1957).

As indicated in my earlier paper, one of the best sources of information on *Astata* is the excellent paper on *A. boops* (Schrank) by Tsuneki (1947). This is in Japanese with an English summary. Unfortunately, Tsuneki's paper was omitted from my bibliography and I wish to take this opportunity to correct this oversight. Powell and Burdick (1960) published a detailed account of a colony of *A. occidentalis* Cresson from Alameda County, California. Since this is a species studied by me in Indiana, their study provides an unusual opportunity for comparison of the behavior of two widely separated colonies of one species.

Astata bicolor Say On May 11, 1958 a single female of this species was found nesting on the beach of Laguna Madre, near Port Isabel, Cameron County, Texas. The soil consisted of hard-packed sand containing bits of shells and some organic matter. The nest was situated on the side of a slight elevation covered with halophytes. The entrance, surrounded by a rim of soil with a radius of 2 cm. and a height of 1 cm., was several centimeters from the nearest plants and not overhung by them. It was open most of the day, but at 4 P.M., a plug of soil about .5 cm. inside the entrance, closed it. I was busy with other digger wasps and did not actually see the wasp but marked the nest as that of an *Astata*. In the evening the nest was excavated and a female *A. bicolor* Say [det. K. V. Krombein] was found in the bottom of

the nearly vertical burrow at a depth of 10 cm. There were five fully provisioned cells, to the side of the burrow and separated from it and each other by 1–2 cm. of sand. They varied in depth from 7 to 10 cm. and each measured about 5 × 9 mm. As usual in this genus, the cells were smooth-walled and somewhat oblique. Two cells had six bugs and three had eight bugs; all bugs were similar and were small nymphs of an unrecognizable genus and species of the family Pentatomidae [det. H. Ruckes]. Four of the cells had an egg on the bottom bug in the usual manner of the genus. In the fifth cell there was an egg on the bug next to the bottom, the bottom bug being a minute nymph which was in the cell venter-up rather than venter-down as usual. All bugs appeared dead. Three of the eggs hatched in two days and the larvae (Evans, 1959) after five days of feeding were preserved.

This species has been studied briefly by the Peckhams (1898) in Wisconsin. They found it nesting in their garden, with the nest entrances overhung by vegetation as in *unicolor*. Because females of *unicolor* are sometimes "bicolored", that is, they have red abdomens, it is possible that the Peckham's had only *unicolor* in their garden but were applying the name *bicolor* to some of them.

Astata leuthstromi Ashmead Another female of this species was found nesting in my garden near Ithaca, New York on September 6, 1958 in almost the same place as the specimen found in 1956. The female descended to her nest with a stinkbug clasped beneath her in the usual manner of the genus, but I had disturbed the area and she was unable to find her nest. She left the area and returned several times, each time landing on the ground and dragging the bug about by its antennae. Finally she abandoned the bug and shortly thereafter found the open entrance to her nest. She entered the nest, emerged from it and after making a long orientation flight, flew away without trying to find the bug she had abandoned. This nest was observed periodically for several days but no change was noted and the female was not seen again. On September 14th the entrance was still open and I dug out the nest. The burrow was only 1.5 cm long and near the bottom of the burrow, at a depth of only 2 cm. were two cells, each oblique, smooth-walled and measuring about 6 × 10 cm. One cell had five bugs and a small larva was feeding on the bottom one in an inverted position. The other cell contained a pasty

mass of several bugs and a dead larva. The intact bugs were preserved and found to be early instar nymphs of *Acrosternum hilare* Say (Pentatomidae) [det. H. Ruckes].

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We note with regret the death of:

Johannsen, Oskar, who died on November 6, 1961 at the age of 91. Professor Johannsen, internationally known in entomological circles, was an authority on aquatic flies. He was a student of Professor John Henry Comstock and was author of several books and many articles on entomology.

Sutherland, Gordon, 50, of Glenn Ridge, New Jersey who served as economic entomologist for the Rockefeller Foundation and at the time of his death was manager of Cyanamid International's Agricultural Department.